



# Scientific Drilling FINAL REPORT



<b>Company:</b> NORTHWEST Nat. Gas	<b>Date:</b> 8/3/2005	<b>Time:</b> 13:08:21	<b>Page:</b> 1
<b>Field:</b> MIST	<b>Co-ordinate(NE) Reference:</b> Well: IW 42dh-10-65 FIN REV, Grid North		
<b>Site:</b> REICHOLD	<b>Vertical (TVD) Reference:</b> IW 42dh-10-65 FIN 904.3		
<b>Well:</b> IW 42dh-10-65 FIN REV	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,263.65Azi)		
<b>Wellpath:</b> IW 42dh-10-65 SUR	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

<b>Survey:</b> IW 42dh-10-65 E-Field Tool	<b>Start Date:</b> 8/3/2005		
<b>Company:</b> Scientific Drilling	<b>Engineer:</b> Ronnie Stockton		
<b>Tool:</b> EM-MWD;E-FIELD	<b>Tied-to:</b> From Surface		

<b>Field:</b> MIST OREGON U.S.A.	<b>Map Zone:</b> Oregon, Northern Zone		
<b>Map System:</b> US State Plane Coordinate System 1927	<b>Coordinate System:</b> Well Centre		
<b>Geo Datum:</b> NAD27 (Clarke 1866)	<b>Geomagnetic Model:</b> igrf2005		
<b>Sys Datum:</b> Mean Sea Level			

<b>Site:</b> REICHOLD SEC. 23, T6N, R5W COLUMBIA CTY. OREGON, U.S.A.			
<b>Site Position:</b>	<b>Northing:</b> 857000.00 ft	<b>Latitude:</b> 45 59 2.754 N	
<b>From:</b> Map	<b>Easting:</b> 1295000.00 ft	<b>Longitude:</b> 123 16 25.298 W	
<b>Position Uncertainty:</b> 0.00 ft		<b>North Reference:</b> Grid	
<b>Ground Level:</b> 0.00 ft		<b>Grid Convergence:</b> -1.97 deg	

<b>Well:</b> IW 42dh-10-65 FIN REV SUR. N 870222.00, E 1294717.50 071505	<b>Slot Name:</b>		
<b>Well Position:</b> +N/-S 13222.00 ft	<b>Northing:</b> 870222.00 ft	<b>Latitude:</b> 46 1 13.109 N	
+E/-W -282.50 ft	<b>Easting:</b> 1294717.50 ft	<b>Longitude:</b> 123 16 35.730 W	
<b>Position Uncertainty:</b> 0.00 ft			

<b>Wellpath:</b> IW 42dh-10-65 SUR	<b>Drilled From:</b> Surface		
<b>Current Datum:</b> IW 42dh-10-65 FIN	<b>Tie-on Depth:</b> 0.00 ft		
<b>Magnetic Data:</b> 7/19/2005	<b>Above System Datum:</b> Mean Sea Level		
<b>Field Strength:</b> 53812 nT	<b>Declination:</b> 17.38 deg		
<b>Vertical Section:</b> Depth From (TVD)	<b>Mag Dip Angle:</b> 67.89 deg		
ft	+N/-S	ft	Direction
	ft	ft	deg
0.00	0.00	0.00	263.65

**Survey**

Stn	CLen ft	MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsD ft	ClsA deg
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	150.00	150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	314.00	464.00	0.95	202.90	463.99	1.27	-2.40	-1.01	0.30	0.30	0.00	2.60	202.90
4	60.00	524.00	2.77	223.58	523.95	2.62	-3.91	-2.21	3.18	3.03	34.47	4.49	209.45
5	59.00	583.00	4.61	216.21	582.83	5.32	-6.85	-4.59	3.21	3.12	-12.49	8.25	213.81
6	61.00	644.00	6.21	216.19	643.55	9.21	-11.49	-7.99	2.62	2.62	-0.03	14.00	214.79
7	61.00	705.00	8.97	219.37	704.01	14.85	-17.83	-12.95	4.57	4.52	5.21	22.04	215.99
8	61.00	766.00	9.27	220.85	764.24	21.85	-25.23	-19.18	0.62	0.49	2.43	31.69	217.25
9	60.00	826.00	9.21	212.17	823.47	28.39	-32.95	-24.90	2.32	-0.10	-14.47	41.30	217.08
10	61.00	887.00	8.08	213.08	883.77	34.16	-40.67	-29.84	1.87	-1.85	1.49	50.44	216.27
11	62.00	949.00	8.39	208.39	945.13	39.50	-48.30	-34.37	1.19	0.50	-7.56	59.28	215.43
12	60.00	1009.00	7.90	212.80	1004.53	44.60	-55.62	-38.68	1.32	-0.82	7.35	67.75	214.82
13	60.00	1069.00	7.86	211.65	1063.96	49.73	-62.58	-43.07	0.27	-0.07	-1.92	75.97	214.54
14	61.00	1130.00	7.96	212.01	1124.38	54.92	-69.71	-47.50	0.18	0.16	0.59	84.35	214.27
15	62.00	1192.00	8.01	213.29	1185.78	60.34	-76.96	-52.14	0.30	0.08	2.06	92.96	214.12
16	62.00	1254.00	7.97	212.98	1247.18	65.82	-84.18	-56.85	0.09	-0.06	-0.50	101.58	214.04
17	63.00	1317.00	7.97	213.10	1309.57	71.36	-91.50	-61.62	0.03	0.00	0.19	110.31	213.96
18	63.00	1380.00	7.83	212.47	1371.97	76.83	-98.78	-66.31	0.26	-0.22	-1.00	118.97	213.87
19	62.00	1442.00	9.36	223.91	1433.28	83.35	-105.97	-72.07	3.69	2.47	18.45	128.16	214.22
20	31.00	1473.00	10.86	232.40	1463.80	87.79	-109.57	-76.13	6.81	4.84	27.39	133.43	214.79
21	31.00	1504.00	11.96	240.56	1494.19	93.24	-112.93	-81.24	6.29	3.55	26.32	139.12	215.73
22	30.00	1534.00	12.69	249.56	1523.50	99.30	-115.61	-87.04	6.84	2.43	30.00	144.71	216.97
23	31.00	1565.00	13.23	259.32	1553.71	106.14	-117.46	-93.72	7.26	1.74	31.48	150.27	218.59
24	31.00	1596.00	15.96	260.99	1583.71	113.93	-118.78	-101.41	8.91	8.81	5.39	156.19	220.49



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<b>Site:</b> REICHOLD	<b>Vertical (TVD) Reference:</b> IW 42dh-10-65 FIN 904.3		
<b>Well:</b> IW 42dh-10-65 FIN REV	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,263.65Azi)		
<b>Wellpath:</b> IW 42dh-10-65 SUR	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

### Survey

Stn	CLen ft	MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsD ft	ClsA deg
25	31.00	1627.00	17.26	264.75	1613.42	122.79	-119.87	-110.20	5.44	4.19	12.13	162.83	222.59
26	32.00	1659.00	19.63	265.39	1643.77	132.91	-120.74	-120.29	7.43	7.41	2.00	170.43	224.89
27	31.00	1690.00	21.90	265.22	1672.75	143.89	-121.64	-131.24	7.33	7.32	-0.55	178.94	227.17
28	31.00	1721.00	23.56	265.03	1701.35	155.87	-122.66	-143.18	5.36	5.35	-0.61	188.53	229.41
29	30.00	1751.00	25.18	265.89	1728.67	168.24	-123.64	-155.52	5.53	5.40	2.87	198.67	231.52
30	32.00	1783.00	27.03	266.38	1757.41	182.31	-124.58	-169.56	5.82	5.78	1.53	210.41	233.69
31	31.00	1814.00	29.04	266.69	1784.77	196.86	-125.46	-184.11	6.50	6.48	1.00	222.79	235.73
32	31.00	1845.00	31.05	268.12	1811.60	212.34	-126.16	-199.61	6.88	6.48	4.61	236.14	237.71
33	32.00	1877.00	33.22	267.41	1838.70	229.32	-126.83	-216.62	6.88	6.78	-2.22	251.01	239.65
34	31.00	1908.00	35.08	266.91	1864.35	246.69	-127.69	-234.00	6.07	6.00	-1.61	266.57	241.38
35	31.00	1939.00	37.04	267.20	1889.41	264.90	-128.63	-252.22	6.35	6.32	0.94	283.13	242.98
36	31.00	1970.00	39.13	267.62	1913.81	283.98	-129.49	-271.32	6.79	6.74	1.35	300.64	244.49
37	31.00	2001.00	41.55	268.13	1937.44	303.99	-130.23	-291.37	7.88	7.81	1.65	319.15	245.92
38	31.00	2032.00	43.69	267.69	1960.25	324.92	-131.00	-312.35	6.97	6.90	-1.42	338.71	247.25
39	32.00	2064.00	45.70	266.75	1982.99	347.39	-132.09	-334.83	6.61	6.28	-2.94	359.94	248.47
40	31.00	2095.00	47.99	265.40	2004.20	369.98	-133.65	-357.39	8.04	7.39	-4.35	381.56	249.50
41	31.00	2126.00	50.21	265.03	2024.49	393.40	-135.60	-380.73	7.22	7.16	-1.19	404.16	250.40
42	31.00	2157.00	51.64	265.98	2044.03	417.45	-137.48	-404.73	5.19	4.61	3.06	427.44	251.24
43	32.00	2189.00	53.27	266.77	2063.53	442.79	-139.09	-430.05	5.46	5.09	2.47	451.98	252.08
44	30.00	2219.00	55.49	266.15	2081.00	467.15	-140.59	-454.38	7.59	7.40	-2.07	475.64	252.81
45	31.00	2250.00	57.70	265.36	2098.07	493.01	-142.51	-480.19	7.44	7.13	-2.55	500.89	253.47
46	31.00	2281.00	59.70	265.47	2114.17	519.48	-144.63	-506.59	6.46	6.45	0.35	526.83	254.07
47	30.00	2311.00	61.75	265.74	2128.84	545.63	-146.63	-532.68	6.88	6.83	0.90	552.50	254.61
48	31.00	2342.00	64.07	266.56	2142.96	573.20	-148.48	-560.22	7.85	7.48	2.65	579.56	255.16
49	31.00	2373.00	66.26	267.33	2155.98	601.29	-149.98	-588.31	7.42	7.06	2.48	607.13	255.70
50	31.00	2404.00	68.70	267.05	2167.85	629.87	-151.39	-616.91	7.92	7.87	-0.90	635.21	256.21
51	16.00	2420.00	70.00	267.05	2173.49	644.81	-152.16	-631.86	8.12	8.12	0.00	649.92	256.46
52	14.00	2434.00	71.63	265.70	2178.09	658.02	-152.99	-645.05	14.78	11.64	-9.64	662.95	256.66
53	35.00	2469.00	67.98	266.86	2190.17	690.83	-155.13	-677.83	10.88	-10.43	3.31	695.35	257.11
54	31.00	2500.00	68.47	267.32	2201.67	719.56	-156.59	-706.58	2.10	1.58	1.48	723.72	257.50
55	31.00	2531.00	70.14	266.81	2212.63	748.51	-158.08	-735.54	5.60	5.39	-1.65	752.33	257.87
56	31.00	2562.00	73.51	266.53	2222.30	777.92	-159.79	-764.94	10.90	10.87	-0.90	781.45	258.20
57	32.00	2594.00	77.55	266.49	2230.29	808.86	-161.67	-795.86	12.63	12.62	-0.12	812.11	258.52
58	31.00	2625.00	81.45	266.89	2235.94	839.29	-163.43	-826.28	12.64	12.58	1.29	842.29	258.81
59	31.00	2656.00	83.78	268.35	2239.92	869.96	-164.71	-857.00	8.85	7.52	4.71	872.68	259.12
60	31.00	2687.00	85.43	269.34	2242.84	900.69	-165.33	-887.85	6.20	5.32	3.19	903.11	259.45
61	31.00	2718.00	86.60	270.83	2244.99	931.42	-165.28	-918.77	6.10	3.77	4.81	933.52	259.80
62	31.00	2749.00	88.56	271.20	2246.30	962.14	-164.73	-949.74	6.43	6.32	1.19	963.92	260.16
63	31.00	2780.00	90.50	271.22	2246.56	992.86	-164.08	-980.73	6.26	6.26	0.06	994.36	260.50
64	32.00	2812.00	90.64	271.04	2246.24	1024.59	-163.45	-1012.72	0.71	0.44	-0.56	1025.83	260.83
65	31.00	2843.00	90.64	271.16	2245.89	1055.33	-162.85	-1043.72	0.39	0.00	0.39	1056.34	261.13
66	31.00	2874.00	90.64	271.02	2245.55	1086.06	-162.26	-1074.71	0.45	0.00	-0.45	1086.89	261.41
67	31.00	2905.00	90.50	271.00	2245.24	1116.81	-161.72	-1105.70	0.46	-0.45	-0.06	1117.47	261.68
68	31.00	2936.00	89.09	270.06	2245.35	1147.58	-161.43	-1136.70	5.47	-4.55	-3.03	1148.11	261.92
69	30.00	2966.00	89.23	270.06	2245.79	1177.39	-161.40	-1166.70	0.47	0.47	0.00	1177.81	262.12
70	61.00	3027.00	89.16	269.70	2246.65	1238.02	-161.53	-1227.69	0.60	-0.11	-0.59	1238.27	262.50
71	107.00	3134.00	89.23	269.88	2248.15	1344.40	-161.92	-1334.68	0.18	0.07	0.17	1344.46	263.08



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<b>Site:</b> REICHOLD	<b>Vertical (TVD) Reference:</b> IW 42dh-10-65 FIN 904.3		
<b>Well:</b> IW 42dh-10-65 FIN REV	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,263.65Azi)		
<b>Wellpath:</b> IW 42dh-10-65 SUR	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

## Annotation

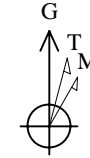
MD	TVD



Field: MIST  
 Site: REICHOLD  
 Well: IW 42dh-10-65 FIN REV  
 Wellpath: IW 42dh-10-65 SUR  
 Survey: IW 42dh-10-65

WELLPATH DETAILS

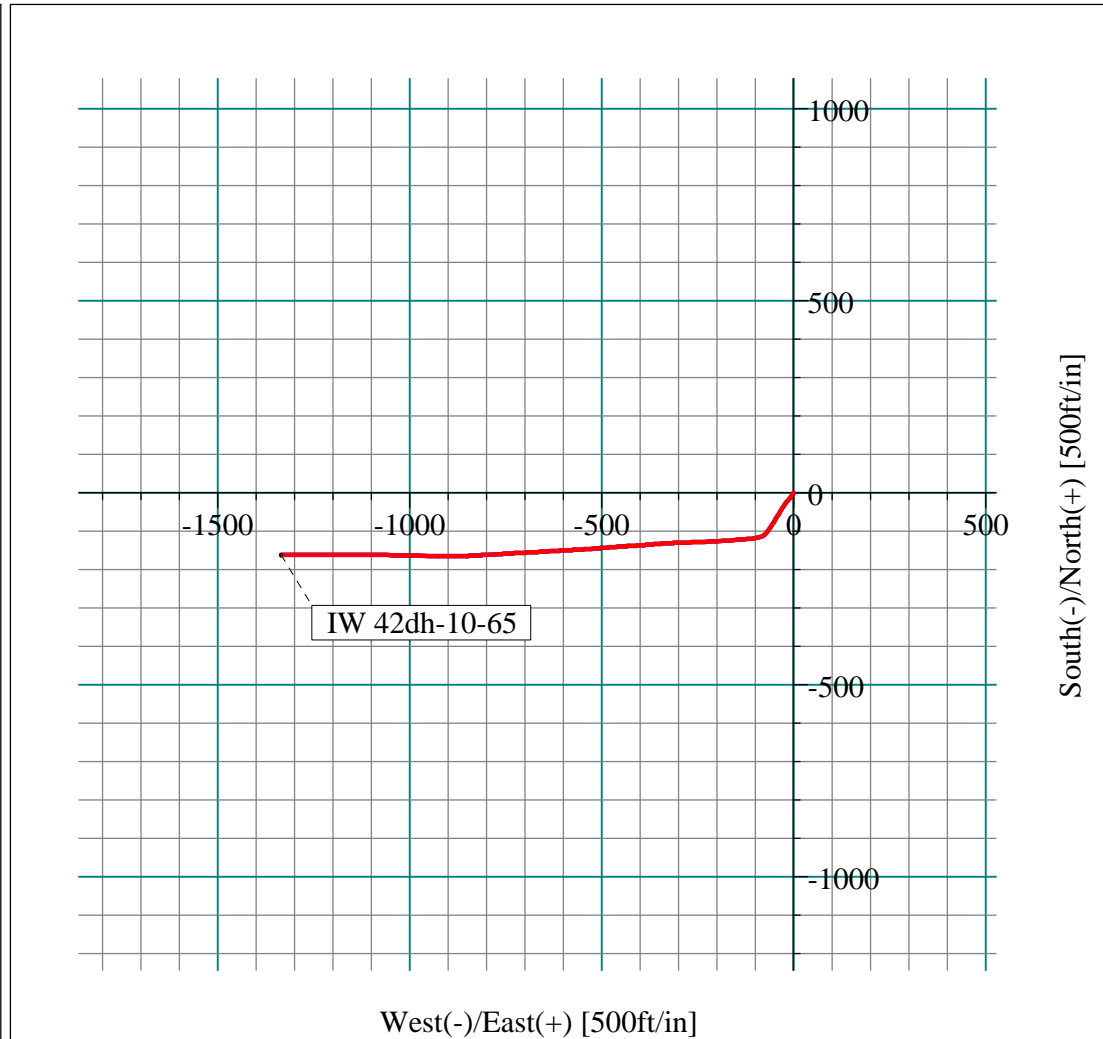
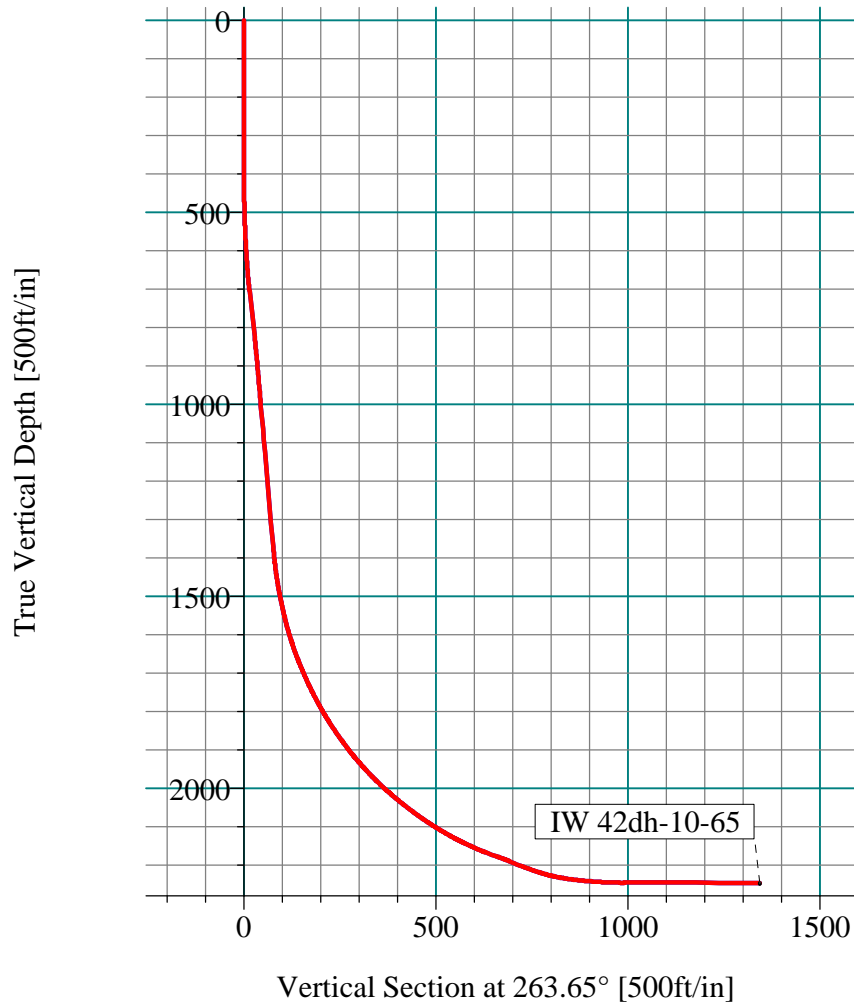
IW 42dh-10-65 SUR			
Rig:	Taylor 9		
Ref. Datum:	IW 42dh-10-65 FIN 904.30ft		
V. Section Angle	Origin +N/-S	Origin +E/-W	Starting From TVD
263.65°	0.00	0.00	0.00



Azimuths to Grid North  
 True North: 1.97°  
 Magnetic North: 19.35°

Magnetic Field  
 Strength: 53812nT  
 Dip Angle: 67.89°  
 Date: 7/19/2005  
 Model: igrf2005

**FINAL PLOT**



THIS SURVEY IS CORRECT TO THE BEST OF MY KNOWLEDGE AND IS SUPPORTED BY ACTUAL FIELD DATA.

Chandler M. Smith.....COMPANY REPRESENTATIVE

